

## CLAIMS

What is claimed is:

5           1.     A method for fabricating a fire retardant composite panels  
comprising:

          creating a water-based slurry of partially soluble boron salts;

          adding an adhesive to a ligneous material; and

          independently introducing said water-based slurry to said ligneous  
10   material for fire retarding thereof.

          2.     The method as recited in Claim 1, wherein said fire retardant  
composite panel is selected from the group comprising particle board, medium  
density fiber board, oriented strand board, laminated veneer lumber, and agri-  
15   boards.

          3.     The method as recited in Claim 1, wherein said creating  
comprises adding boric acid and borax pentahydrate to water and wherein said  
water-based slurry comprises a boron salt solution and a plurality of suspended  
20   boron salt particles.

4. The method as recited in Claim 3, wherein said creating further comprises selecting a potential of hydrogen (pH) for said water-based slurry of substantially between 4.5 and 5.2.

5 5. The method as recited in Claim 3, wherein said creating further comprises reducing the particle size of said suspended boron salt solids in said water-based slurry.

6. The method as recited in Claim 1, wherein said fire retardant  
10 composite panel is substantially compliant with the American Society for Testing and Materials (ASTM) E-84 class 1 standard for fire retardance.

7. The method as recited in Claim 6, wherein said fire retardant composite panel has a density of between 40-48 pounds per cubic foot (lb/ft<sup>3</sup>).

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8. The method as recited in Claim 7, wherein said fire retardant composite panel has an internal strength of 100 pounds per square inch (psi) or greater.

20 9. The method as recited in Claim 6, wherein said fire retardant composite panel comprises approximately 1.75% boron w/w expressed as "B" on an "as is" basis, or less.

10. A composite panel comprising:  
a ligneous material bound to an adhesive; and  
*a fire retardant material disposed within said ligneous material, wherein*  
said composite panel has a density of less than 45 pounds per cubic foot (lb/ft<sup>3</sup>).

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11. The composite panel as described in Claim 10, wherein said  
composite panel has an internal strength of 100 pounds per square inch (psi) or  
greater.

10 12. The composite panel as described in Claim 10, wherein said is  
substantially compliant with the American Society for Testing and Materials  
(ASTM) E-84 class 1 standard for fire retardance.

13. A composite panel as described in Claim 10, wherein said fire  
15 retardant material is a mixture of boron salts.

14. The composite panel as described in Claim 13, wherein said  
composite panel comprises approximately 1.75% boron w/w expressed as "B"  
on an "as is" basis, or less.

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15. The composite panel as described in Claim 10, wherein said  
composite panel is selected from the group comprising particle board, medium

density fiber board, oriented strand board, laminated veneer lumber, and agri-boards.

16. A system for creating a fire retardant composite panel comprising:  
5 a supplier for supplying a ligneous material; and  
an injection manifold coupled with said supplier for controlling the  
amount of an adhesive being added to said ligneous material and for  
controlling the amount of a water-based slurry of partially soluble boron salts to  
being added said ligneous material independently from said adhesive.

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17. The system of Claim 16, wherein said ligneous material is  
selected from the group consisting of wood fibers, wood strands, wood veneers  
wood particles, and agricultural residues.

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18. The system of Claim 16, wherein said water-based slurry  
comprises a solution of boron salts and suspended boron solids.

19. The system of Claim 18, wherein the potential of hydrogen (pH) for  
said water-based slurry is substantially in the range of 4.5 to 5.2.

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20. The system of Claim 18, further comprising a milling device for  
reducing the particle size of the suspended boron salt solids.

21. The system of Claim 16, wherein said fire retardant composite panel is substantially compliant with the American Society for Testing and Materials (ASTM) E-84 class 1 standard for fire retardance.

5        22. The system of Claim 21, wherein said fire retardant composite panel has a density of less than 45 pounds per cubic foot (lb/ft<sup>3</sup>).

23. The system of Claim 22, wherein said fire retardant composite panel has an internal strength of 100 pounds per square inch (psi) or greater.

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24. The system of Claim 23, wherein said fire retardant composite panel comprises approximately 1.75% boron w/w expressed as "B" on an "as is" basis, or less.

15        25. The system of Claim 16, wherein said fire retardant composite panel is selected from the group comprising particle board, medium density fiber board, oriented strand board, laminated veneer lumber, and agricultural residues.

20        26. A composite panel that is substantially compliant with the American Society for Testing and Materials (ASTM) E-84 class 1 standard for fire retardance and has a density less than 45 pounds per cubic foot (lb/ft<sup>3</sup>).

27. The composite panel of Claim 26, wherein said composite panel comprises:

a ligneous material;

an adhesive; and

5 a fire retardant made from a water-based slurry of partially soluble boron salts.

28. The composite panel of Claim 27, wherein said ligneous material is selected from the group comprising wood fibers, wood particles, wood  
10 veneer, wood strands, and agricultural residues.

29. The composite panel of Claim 27, wherein said water-based slurry comprises a boron salt solution and a suspension of boron salt particles.

15 30. The composite panel of Claim 27, wherein said water-based slurry comprises boric acid and borax pentahydrate.

31. The composite panel of Claim 30, wherein said water-based slurry has a potential of hydrogen (pH) of substantially between 4.5. and 5.2.

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32. The composite panel of Claim 31, wherein said composite panel has an internal strength of 100 ponds per square inch (psi) or greater.

33. The composite panel of Claim 32, wherein said composite panel comprises approximately 1.75% boron w/w expressed as "B" on an "as is" basis, or less.

5 34. The composite panel of Claim 27, wherein said water-based slurry is added to said ligneous material independently from the addition of said adhesive.